

THAT WHICH IS CLAIMED:

1. An optical circuit comprising:

a main body comprising:

a flexible substrate; and

5 a plurality of optical fibers mounted so as to lie in a common plane upon said substrate, said optical fibers arranged in a plurality of groups proximate an edge of said substrate with each group including at least one optical fiber, said optical fibers of a first group extending toward said optical fibers of a second group; and

10 a plurality of legs extending outwardly from the edge of said main body, each leg comprising said optical fibers of a respective group and a matrix material for binding said optical fibers of the respective group together, said legs disposed in a stacked configuration in which at least one leg overlies another leg such that at least one leg lies at least partially outside of the common plane.

15 2. An optical circuit according to Claim 1 wherein said plurality of groups of optical fibers extend in a parallel, spaced apart arrangement across a portion of said flexible substrate, and wherein said second group of optical fibers overlies said first group of optical fibers while said first group of optical fibers is supported by said flexible substrate.

3. An optical circuit according to Claim 1 further comprising a first fiber optic connector mounted upon said plurality of legs in the stacked configuration.

20 4. An optical circuit according to Claim 3 further comprising a plurality of second fiber optic connectors mounted upon respective groups of said optical fibers proximate another edge of said main body.

25 5. An optical circuit according to Claim 1 wherein said matrix material of at least one leg comprises a coating such that the respective leg is independent of the flexible substrate.

6. An optical circuit comprising:

a main body comprising:

a flexible substrate; and

a plurality of optical fibers mounted upon said substrate, said optical fibers

5 arranged in a plurality of groups proximate an edge of said substrate with each group including at least one optical fiber; and

a plurality of legs extending outwardly from said main body in a stacked configuration in which at least one leg overlies another leg, each leg comprising said optical fibers of a respective group and a matrix material for binding said optical fibers of the respective group together, said matrix material of at least one leg comprising a coating such that the respective leg is independent of the flexible substrate.

7. An optical circuit according to Claim 6 further comprising a first fiber optic connector mounted upon said plurality of legs in the stacked configuration.

8. An optical circuit according to Claim 7 wherein each optical fiber extends from a respective first end upon which said first fiber optic connector is mounted, across said flexible substrate to an opposed second end, and wherein the optical circuit further comprises a plurality of second fiber optic connectors mounted upon the second ends of the optical fibers of respective groups.

9. An optical circuit according to Claim 6 wherein said plurality of groups of optical fibers extend in a parallel, spaced apart arrangement across a portion of said flexible substrate, and wherein said optical fibers of one group extend toward said optical fibers of another group while each group of optical fibers is supported by said flexible substrate.

10. An optical circuit according to Claim 9 wherein the group of optical fibers that extends toward the other group of optical fibers separates from said flexible substrate and transitions so as to overlie the other group of optical fibers while the other group of optical fibers is supported by said flexible substrate.

11. An optical circuit comprising:

a main body comprising:

a flexible substrate; and

5 a plurality of optical fibers mounted upon said substrate and arranged in a plurality of groups proximate an edge of said substrate with each group including at least one optical fiber; and

a plurality of legs including first, second and third legs extending outwardly from said main body, each leg comprising said optical fibers of a respective group and a matrix material for binding said optical fibers of the respective group together, said legs
10 disposed in a stacked configuration with said first and second legs transitioning so as to overlie said third leg at different locations along a length of said third leg.

12. An optical circuit according to Claim 11 wherein said matrix material of at least said first and second legs comprising a coating such that at least said first and second legs are independent of the flexible substrate.

15 13. An optical circuit according to Claim 11 wherein said plurality of groups of optical fibers extend in a parallel, spaced apart arrangement across a portion of said flexible substrate, and wherein said optical fibers of one group extend toward said optical fibers of another group while the respective groups of optical fibers remain supported by said flexible substrate.

20 14. An optical circuit according to Claim 11 further comprising a first fiber optic connector mounted upon said plurality of legs in the stacked configuration.

15 15. An optical circuit according to Claim 14 wherein each optical fiber extends from a respective first end upon which said first fiber optic connector is mounted, across said flexible substrate to an opposed second end, and wherein the optical circuit further comprises a plurality of second fiber optic connectors mounted upon the second
25 ends of the optical fibers of respective groups.

16. A method of fabricating an optical circuit comprising:
providing a main body comprising a flexible substrate and a plurality of groups of optical fibers proximate an edge of and adhered to the flexible substrate, each group including at least one optical fiber;

5 positioning a first group of optical fibers so as to overlie a second group of optical fibers; and

coating the first group of optical fibers with a matrix material once the first group of optical fibers is positioned to overlie the second group of optical fibers.

10 17. A method according to Claim 16 further comprising securing the first and second groups of optical fibers relative to one another after positioning the first group of optical fibers so as to overlie the second group of optical fibers.

18. A method according to Claim 17 further comprising releasing the first and second groups of optical fibers after coating at least the first group of optical fibers with the matrix material.

15 19. A method according to Claim 18 wherein securing the first and second groups of optical fibers comprises attaching the first and second groups of optical fibers to opposite sides of an adhesive coated spacer while coating at least the first group of optical fibers with the matrix material, and wherein releasing the first and second groups of optical fibers comprises removing the adhesive coated spacer after coating at least the
20 first group of optical fibers with the matrix material.

20. A method according to Claim 16 wherein coating the first group of optical fibers comprises spraying a coating of the matrix material onto the first group of optical fibers.

25 21. A method according to Claim 16 further comprising repeating said positioning and coating steps for a third group of optical fibers which also overlies the second group of optical fibers following positioning and coating the first group of optical fibers.